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ABSTRACT

The purpose of this study was to examine the relationship between reading comprehension and the perception of syntactic and semantic errors by fourth graders. Forty-eight students were divided according to reading comprehension tests into high and low performance groups. Each student then read orally twelve sentences, of which four were normal sentences with transitive verbs, four contained a semantic violation, and four contained both semantic and syntactic violations. Insertions, omissions, substitutions, and repetitions were scored as errors. Analysis of data reveals that high comprehenders showed greater sensitivity to semantic and syntactic violations than did low comprehenders. Four implications from the present study are apparent: (1) that reading comprehension is not merely a function of word recognition, (2) that good and poor comprehenders of equal word recognition ability differ in their use of syntactic and semantic cues, (3) that reading comprehension should be viewed as a process involving the integration of word meanings through the use of these cues, and (4) that poor readers need instruction emphasizing the use of language cues in comprehension.

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The Effect of Syntactic and Semantic Violation
on High and Low Reading Comprehenders

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The primary purpose of this study is to examine cognitive processing strategies utilized by fourth grade students in comprehending written language. More specifically the paper encompasses the question:

Do children of varying reading comprehension abilities also vary in the degree to which they perceive syntactic and semantic relationships?

Reading comprehension has always been considered a complicated and multifaceted process. There can be little doubt that the ability to decode and associate meaning with single words is an important and primary component of the process. Numerous factor analytic studies, such as those reviewed by Spache (1962), confirm the notion that facility with single words is an integral factor of comprehension. Studies such as that reported by Perfetti and Hogaboam (1975) account for the difference between good and poor readers largely on the basis of decoding ability.

¹This paper was presented at the 1976 meeting of the American Educational Research Association, San Francisco. Additional copies can be obtained by writing to John W. Miller, College of Education, Box 28, Wichita State University, Wichita, Kansas 67208

Other recent research has shown that good reading comprehension is not a direct function of good word identification skills. Cromer (1968) has provided a useful conceptualization of the reading comprehension problem. He identifies two groups of poor readers: the deficit group and the difference group. The deficit poor readers experience comprehension difficulties presumably because of a deficiency in vocabulary and word identification skills. Thus, the deficit group fails to comprehend because of a failure to extract the meanings of individual words. The difference poor readers, on the other hand, have word identification skills commensurate with those of good readers. However, they differ from good readers in that they do not adequately comprehend sentence or passage meaning.

A series of studies (Cromer, 1970; Oakan, Wiener, and Cromer, 1971; Steiner, Wiener, and Cromer, 1971) have been conducted following Cromer's conceptualization of comprehension difficulties. The results of this research have supported the position that there is a group of readers who fail to comprehend, not because of a lack of word identification skill, but because these individuals do not integrate the meanings of separate words to arrive at the meaning of an entire sentence.

Differing abilities of readers to use context clues

has been a critical yet confused area in reading research. Goodman (1965) indicates that words in meaningful context are more easily read than are words in isolation. While Goodman examined this phenomena across the three primary grade levels, he did not distinguish between the reading abilities within his sample. Two other studies (Weinstein and Rabinovitch, 1971; Clay and Imlach, 1971) provide support for the view that poor readers do not make use of syntactic context cues, nor do they process groups of words as defined by the syntactic and semantic structure of the sentence. Instead, poor readers seem to process only one word at a time and thus do not integrate word meanings.

Unfortunately, many teachers of reading hold to the notion that comprehension is merely a function of the ability to decode individual words. Although studies such as those cited above have attempted to refute this long held point of view, they have a critical flaw which prevents the necessary generalizability. The high and low reading groups have been defined on the basis of "general reading ability". It may be argued that general reading ability is a function of word recognition ability, and therefore the reason that the authors of the above studies found differences in the abilities of high and low readers to use syntactic and semantic constraints was simply that the groups were at least partially defined on the basis of ability to

read single words.

The present study differs from those cited in that difference poor readers are compared with good readers. That is, while the two groups differ in comprehension ability they are equivalent in the ability to recognize individual words. Thus, any differences found between the two groups in sensitivity to syntactic or semantic cues can be attributed to differences in comprehension processes. It was hypothesized that high comprehenders would be sensitive to violations of semantic and syntactic constraints in sentences as indexed by an increase in oral reading errors on words at or near the point of violation. The same disruptive effect was not expected among poor comprehenders since, as theorized, they tend to ignore semantic and syntactic cues and treat words as unrelated items.

Method

Sample

Forty-eight fourth grade students participated in the experiment. They were selected from eight schools in an urban, midwestern school district. Each student was selected to conform to the following specifications:

1. word recognition ability as measured by the vocabulary section of the Iowa Test of Basic Skills was within $\pm .5$ years of grade placement at the time of testing.

2. reading comprehension ability has measured by the Iowa Test of Basic Skills was either .5 years or more above grade level placement at the time of testing (high comprehenders), or .5 years or more below grade level placement at the time of testing (low comprehenders).

On these selection bases the total sample of forty-eight students was drawn to include 24 high comprehenders and 24 low comprehenders having equivalent word recognition abilities.

Materials

Twelve sentence trios of which the following is an example were used.

- A. The old farmer planted the bean seeds in the rich, brown soil.
- B. The old farmer paid the bean seeds in the rich, brown soil.
- C. The old farmer went the bean seeds in the rich, brown soil.

All sentences were 13 words in length. The type A member of a trio was a normal sentence with a transitive verb. A semantic violation occurred in the type B sentence in that another transitive verb was substituted for the original verb which had the effect of making the sentence meaning anomalous. In the type C sentence an intransitive verb was substituted which violated both semantic and syntactic constraints in the sentence frame. The verbs used were of

equal frequency of occurrence. The sentences were typed on cards for presentation to subjects.

Procedure

Each student read orally twelve sentences; four from each type: A, B and C. The order of presentation was counterbalanced across subjects and the readings were tape recorded for scoring purposes. The twelve sentences from each student's reading was the corpus to be analyzed for oral reading errors. Insertions, omissions, substitutions and repetitions were scored as errors. Each error was coded by the position in which it occurred in the sentence.

Design

Two independent variables were utilized in the experiment. The two levels of the independent variable comprehension ability were high and low. The treatment variable operated as a repeated measure on three levels: sentence types A, B and C. Data were collected on four dependent measures as indices of the hypothesized disruptive effect due to syntactic and semantic violations. These were:

1. oral reading errors on the word before and the word after the verb.
2. errors on the verb.
3. errors on the two words before and the two words after the verb.

4. total errors in the sentence

Each student's mean number of errors on each of the three sentence types over each of the four dependent variables comprised the data to be analyzed.

Results and Conclusions

A multivariate analysis of variance (MANOVA) was computed on the data from the four dependent measures. Significant main effects resulted from comprehension ability ($F(4,89) = 19.30, p < .01$) and sentence type ($F(8,178) = 2.25, p < .05$). More importantly with regard to the hypotheses, a significant interaction between comprehension ability and sentence type resulted ($F(8,178) = 2.23, p < .05$).

In order to further examine the significant interaction found in the MANOVA, separate ANOVAs were computed on each of the four dependent measures. The data from dependent measure two, errors on the verb, resulted in a significant interaction between comprehension ability and sentence type ($F(2,92) = 4.70, p < .05$).

Insert Figure One

A Neuman-Keuls test was performed on the six cell means resulting from the two comprehension levels and the three sentence types. There were no significant differences in

the mean number of errors on the verb position across sentence types for the low comprehenders. The high comprehenders showed a significant increase in errors from sentence type A and B to type C. Additionally, the high comprehenders made significantly fewer errors on sentence types A and B than did the low comprehenders (all differences sig. $< .05$).

These results support the hypothesis. High comprehenders showed greater sensitivity to semantic and syntactic violations than did low comprehenders. Four implications from the present study should be noted by researchers and teachers in the area of reading. First, reading comprehension is not merely a function of word recognition ability while it is apparent that decoding is a prerequisite to comprehension, it also appears that adequate word identification does not insure adequate comprehension. Second, good and poor comprehenders of equal word recognition ability differ in the use they make of syntactic and semantic cues. At least some portion of the difference between good and poor comprehension is attributable to the reader's facility in using syntactic and semantic cues. Third, reading comprehension should be viewed as a process involving the integration of individual word meanings through the appropriate use of the available syntactic and semantic cues

in sentences. Finally, difference poor readers need instruction emphasizing the use of language cues to comprehension. The findings of this study do not minimize the necessity of developing adequate word recognition skills, but rather indicate the additional necessity to develop other avenues to reading comprehension.

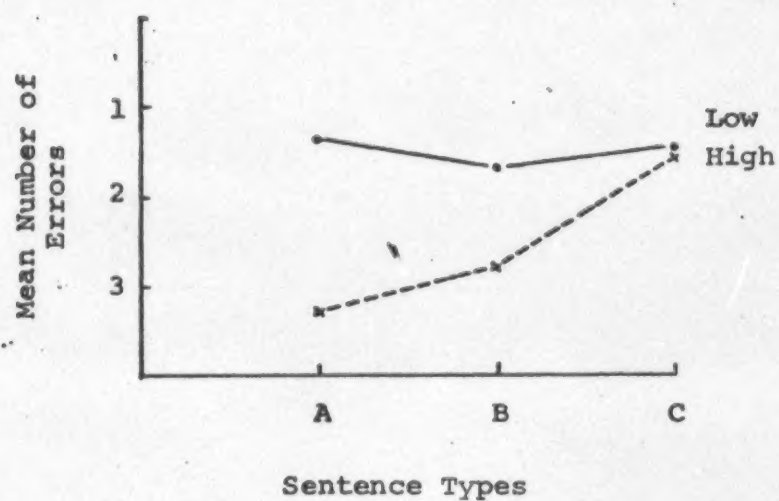


Fig. 1 Mean errors at verb position for high and low comprehenders on sentence types A, B and C.

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